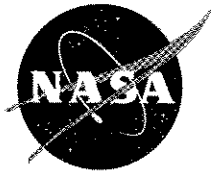
National Aeronautics and
Space Administration
Office of the Administrator
Washington, DC 20546-0001



September 24, 2007

TO: Distribution

FROM: Associate Administrator

SUBJECT: Implementation of NASA Procedural Requirements (NPR) 7120.5D, NASA Space Flight Program and Project Management Requirements

NPR 7120.5D was released on March 6, 2007. Revision D focuses on space flight programs and projects and is part of an effort to realign NASA's basic documents to reflect the NASA Governance Model, as well as to institutionalize excellence in our fundamental processes. Revision C of NPR 7120.5 remains in effect for NASA's other product lines until such time as separate documents are released for these areas.

Revision D defines how NASA will do space flight programs and projects and contains important changes. These changes include a common framework for all programs and projects that results in a unified life cycle for both human and robotic missions, a disciplined review structure for development, assessment, and management of programs and projects, the implementation of Technical Authority, and the formalization of the Agency's Dissenting Opinion process.

The next step is for the Centers and Mission Directorates to efficiently transition their processes, programs, and projects as necessary to fully implement Revision D. This transition should make use of existing organizational policies, practices, and procedures to the maximum extent possible. If a Center or Mission Directorate believes that something less than full implementation is justified for a specific program or project, a waiver request with associated justification should be submitted as permitted by NPR 7120.5D.

Because of the significance of program and project management to mission success and the importance of Revision D in defining how NASA will do programs and projects, I expect a rapid implementation of NPR 7120.5D. In support of this, I have tasked the Chief Engineer to begin surveying Centers, Mission Directorates, and some space flight projects in approximately six months from the date of this letter to review how they are complying with NPR 7120.5D. To make these surveys as successful as possible, I have also tasked the Chief Engineer to provide the Centers and Mission Directorates with assistance and specific guidance related to implementation. The requested guidance is provided in the form of templates to help Centers and Mission Directorates plan their implementation. These templates are attached to this letter and are intended to highlight areas where a mutual understanding is particularly important. While formal NPR 7120.5D Implementation Plans are not required, the templates can serve as a

framework for Centers and Mission Directorates to review their NPR 7120.5D compliance status and develop action plans where needed.

Your efficient and timely implementation of NPR 7120.5D is requested.

C. J. Scolese

Christopher J. Scolese

Enclosures

Distribution
HQ/Associate Administrator for Exploration Systems Mission Directorate
HQ/Associate Administrator for Space Operations Mission Directorate
HQ/Associate Administrator for Science Mission Directorate
HQ/Chief Engineer
HQ/Deputy Chief Engineer
HQ/KGO/Mr. Blythe
ARC/200-1/Dr. Worden
DRFC/2004/Mr. Peterson
GRC/3-2/Dr. Whitlow
GSFC/100.0/Dr. Weiler
JPL/180-904/Dr. Elachi
JSC/AA/Mr. Coats
KSC/AA/Mr. Parsons
LaRC/102/Ms. Roe
MSFC/DA01/Mr. King
SSC/AA00/Dr. Gilbrech

9 August 2007

NPR 7120.5D Implementation Planning Template Background & Overview

As the work of the NPR 7120.5D Development Team was being completed, it was NASA's plan to call for Implementation Plans to be prepared by Centers and Mission Directorates and submitted to the Agency. In that context, Implementation Plan Templates were prepared to provide guidance and a common document structure and to assure that certain key topics were addressed. The roles and responsibilities of Centers and Mission Directorates being distinct, separate Implementation Plan Templates were prepared for each.

Formal Implementation Plans are no longer required. The Office of the Chief Engineer will instead survey Centers, Mission Directorates, and some flight projects to review how they are complying with the NPR. The attached Mission Directorate Implementation Planning Template may now be used as a guide to assess the current status of a Directorate's compliance with NPR 7120.5D requirements and assist in the development of action plans where work is needed to bring a Directorate into compliance with requirements.

The requirements in NPR 7120.5D are organized by life-cycle phase and, thus, related requirements often appear more than once in Chapter 4. The Implementation Planning Template is structured topically, rather than temporally, so that a given subject is addressed just once, and related subjects are organized together. Within the planning template, some descriptive language is provided to give context for the topic, followed by guidance (in italics) bounded by square brackets ([….]).

It is the intent of NASA that compliance with NPR 7120.5D be achieved through use of existing policies, practices, and procedures wherever possible. It is not the intent of NASA that new Center or Directorate policies, practices, or procedures be created if documented ways of doing business that meet the NPR 7120.5D requirements already exist.

The production of a compliance matrix may be the most straightforward approach to demonstrating Mission Directorate compliance with NPR 7120.5D. Such a matrix would tie NPR 7120.5D requirements (i.e., "shall statements" from Chapter 4) to documented Directorate policies, practices, or procedures applicable to its space flight programs and projects. The NASA POLARIS Web site (https://polaris.nasa.gov/index.cfm) contains a compliance matrix which may be used for this purpose if the Directorate elects the use of such as part of its overall approach to implementing NPR7120.5D. [Under Management Support, click on Space Flight, then Requirements, then Compliance Matrix (optional).]

For requirements in NPR 7120.5D for which Mission Directorate policies, practices and/or procedures need to be developed or modified in order to achieve NPR compliance, the Mission Directorate Implementation Planning Template can assist the Directorate in identifying what work needs to be done. These work plans can then be referenced from the compliance matrix, with appropriate descriptive detail provided in support materials.

Where Mission Directorates will seek waivers to NPR 7120.5D requirements, such waivers should be prepared as soon as possible so that appropriate discussions can be held in a timely manner.

Table of Contents

1.0 INTRODUCTION

This Mission Directorate Implementation Plan (MDIP) defines the NASA Procedural Requirements (NPR) 7120.5D Implementation Plan for the [Name of Mission Directorate]. It is approved by the Mission Directorate Associate Administrator, NASA Chief Engineer, the NASA Chief Safety and Mission Assurance (SMA) Officer, and the NASA Program Analysis and Evaluation Office.

1.1 Purpose

The purpose of this plan is to document how the [Name of Directorate] will implement NPR 7120.5D requirements and responsibilities allocated to directorates in managing space flight programs and projects. It also specifies additional Directorate-level policies and practices that apply to flight programs and projects under the purview of the [Name of Mission Directorate].

Chapters 2 and 3 of NPR 7120.5D describe the processes and practices NASA uses to carry out space flight program and project work. Chapter 4 of NPR 7120.5D is written using verifiable "shall" statements that define the requirements that space flight programs/projects must meet. Programs and projects are expected to implement the Agency-prescribed processes and practices identified in NPR 7120.5D, Chapters 2 and 3, and the requirements identified in Chapter 4.

1.2 Scope

This plan describes how the following will be applied to programs and projects managed by [Name of Mission Directorate]:

1. Directorate program and project management practices.
2. Directorate engineering practices (e.g. risk management practices).
3. Directorate SMA practices.
4. Directorate Technical Authority (TA) practices.

It also describes how the [Name of Mission Directorate] Directorate maintains its directorate-level practices and ensures traceability and conformance of these to Agency-level policies, standards, and requirements (NASA Policy Directives [NPDs], NPRs, and other documents listed in Appendix H.1 of NPR 7120.5D).

1.3 Directorate Implementation Plan Owner and Change Control Process

This plan is maintained by [Name of Office].

2.0 DIRECTORATE ORGANIZATION AND INTERFACES

[Discuss directorate roles and responsibilities for implementing NPR 7120.5D. Include at least the following:

1. *Who is responsible for the approval, funding, management control, and oversight of NASA programs and projects?*
2. *What is the allocation of responsibilities between the program directors/executives and program managers?*
3. *Who has major responsibility for assuring that NPR 7120.5D requirements are being met within the directorate?*
4. *What interfaces with other directorates, mission support offices, SMA, the Chief Engineer's Office, centers, programs, or projects are important in overseeing the implementation of programmatic, engineering, SMA, and TA requirements contained in NPR 7120.5D?]*

[Text.]

3.0 DIRECTORATE PRACTICES

3.1 Description

Directorate practices are used to augment Agency NPRs and standards in the development and operations of space flight programs, projects, systems, instruments, and critical ground support facilities. The NPR 7120.5D-relevant directorate policies, requirements documents, procedures, templates, and guidelines are identified below:

1. Program and Project Management: *[List all applicable documents, including a brief description of contents for each.]*

   [First document.]

   [Next document.]

2. Program Engineering: *[List all applicable documents, including a brief description of contents for each.]*

   [First document.]

   [Next document.]

3. Application of Technical Authority: *[List all applicable documents, including a brief description of contents for each.]*

   [First document.]

   [Next document.]

4. Other Supporting Documents: *[List all applicable documents, including a brief description of contents for each.]*

   [First document.]

   [Next document.]

3.2 Development

[Describe the process for developing the above documentation. The following steps will assist in making certain important elements are covered:

1. *Identify what exists.*
2. *Describe how directorate practices, handbooks, and guidelines are flowed down from or relate to NPR 7120.5D.*
3. *Do the above include requirements over and above what is in NPR 7120.5D?*
4. *How does the directorate verify its compliance with Agency practices?]*

[Text.]

3.3 Configuration Control Process

The directorate may issue new or revised practices and procedures at any time circumstances warrant. Revisions may be needed due to evolving Agency Directives.

[Describe how the directorate provides configuration control of the directorate's internal practices and procedures, including how changes are initiated either by the directorate or as a result of new or revised NASA NPDs and NPRs; also include how changes are approved and incorporated into the MDIP.]

[Text.]

3.4 Training Program

[Provide a list of the classes that are used to train directorate personnel in Agency standards and directorate practices and procedures. What are the requirements for attending these classes?]

[Text.]

3.5 Waiver Process

[Describe how the directorate coordinates and approves waivers to directorate practices and requirements. What insight does the directorate retain on engineering, SMA, and TA waivers submitted to the Chief Engineer's Office and SMA Office? How does the directorate ensure that the waiver process defined in NPR 7120.5D, Section 3.6, is followed on directorate programs and projects?]

[Text.]

4.0 IMPLEMENTATION RESPONSE TO NPR 7120.5D

4.1 Management Practices

Per NPR 7120.5D, Mission Directorate Associate Administrators are primarily responsible for managing programs within the Mission Directorate; working with Agency

management to identify needed programs, recommending the assignment of programs and Category 1 projects to Centers; assigning Category 2 and 3 projects to Centers; serving as the Key Decision Point (KDP) Decision Authority for Category 2 and 3 projects; and managing all program requirements, including budgets, schedules, and the high-level programmatic requirements levied on projects within the Mission Directorate.

[Provide descriptions of the following (or reference specific section(s) in a directorate document(s):

1. *Hierarchy of planning documents and approval authorities within the directorate.*
2. *How the directorate establishes directorate policies applicable to programs, projects, and supporting elements.*
3. *How the directorate manages competitions and makes selections for projects within its programs.*
4. *How the directorate stores and configuration-manages approved versions of FADs, Program Plans, and Project Plans, and how Program and Project Plans are updated and maintained consistent with approved budgets from year to year.*
5. *How the directorate establishes and allocates program and project budgets and conducts annual program and project budget submission reviews.*
6. *How the directorate establishes, coordinates, approves, and releases high-level program requirements, high-level project requirements, and project success criteria.*
7. *How the directorate develops its recommendations for assignment of programs and Category 1 projects to Centers.*
8. *How the directorate makes assignments of Category 2 and 3 projects to Centers.*
9. *How the directorate reviews and approves appointment of Category 1 and selected Category 2 Project Managers.*
10. *How the directorate carries out its Program Management Council responsibilities.*
11. *How the directorate conducts and supports Accident Investigation Boards.]*

[Text.]

4.1.1 Partnering

Partnering strategy and execution activities occur throughout the program/project life cycle. Partnering may be with domestic partners (e.g., Federal agencies) and with international contributors (normally foreign governmental entities). In addition, the directorate may partner with one or more additional directorates in the execution of a program/project (e.g., SMD project utilizing Space Operations Mission Directorate [SOMD] launch services).

NPR 7120.5D assigns primary responsibility for establishing partnering arrangements with the Mission Directorates. The Directorates obtain technical inputs from the

program/project and work with the Office of External Relations to generate the appropriate agreements (e.g., memorandum of understanding).

[Provide descriptions of the following (or reference specific section(s) in a directorate document(s):

1. *Directorate process, roles and responsibilities, and interfaces for generating domestic partnering agreements.*
2. *Directorate process, roles and responsibilities, and interfaces for generating international partnering agreements.*
3. *Directorate process for obtaining technical inputs for partnering agreements from program/project.*
4. *Directorate process for coordinating with SOMD if a program/project requires Space Transportation System, launch, or space telecommunications services.]*

[Text.]

4.1.2 Managing the Directorate Portfolio

[Text.]

4.1.2.1 Establishing/Maintaining Program Baselines

The need for new programs is identified by the Agency through evaluation of its Strategic Plan and an Analysis of Alternatives (AoA) process conducted during program pre-formulation. Mission directorates participate in this pre-formulation phase of the program life-cycle as appropriate given the charter of their directorate. Once it is determined by the Agency that a new program should be established, the responsible NASA mission directorate recommends a particular Center to assign responsibility for the program.

The mission directorate authorizes the establishment of a Program Office via a Formulation Authorization Document (FAD) and directs that appropriate formulation phase activities be conducted by the Program Office. Following successful completion of Key Decision Point I, the Program Commitment Agreement (PCA) is approved by the NASA AA, the MDAA approves the Program Plan, and the program enters its implementation phase. The program baseline, the key elements of which are captured in the Program Plan and supporting documents, is matured and maintained throughout the program life-cycle.

[Provide descriptions of the following or reference specific section(s) in a directorate document(s):

1. *How the Directorate supports the Agency's program pre-formulation phase, including conduct of the AoA process, support of the Acquisition Strategy Planning (ASP) Meeting, and issuance of the FAD.*
2. *How the Directorate oversees program formulation phase for directorate programs, through development and approval of the Program Plan.*

3. *How the Directorate oversees the implementation phase of the program life-cycle for Directorate programs, through all implementation phase KDPs (KDP II – KDP n), identification and implementation of all projects comprising the program, through closeout of all projects and of the program itself.]*

[Text.]

4.1.2.2 Overseeing Project Progress

The Directorate oversees the management of projects that are contained within the Directorate program offices. At his/her discretion, the MDAA may have approval authority for the Project Plan, which is the key document capturing the results of the project formulation phase and plans for the project implementation phase. The directorate MDAA is the Decision Authority (DA) for Category 2 and 3 projects, and for Category 1 projects if delegated that responsibility by the NASA AA. Likewise, the Mission Directorate Program Management Council (MDPMC) is the body with management oversight responsibility for Category 2 & 3 projects (and Category 1 if so delegated). The MDPMC provides input to the MDAA for projects it has responsibility to evaluate.

The project's integrated baseline is matured and maintained throughout the project life-cycle, with a draft due at KDP-A, a preliminary at KDP-B, a baseline at KDP-C, and updates thereafter if the project scope changes. The project's integrated baseline consists of the project's technical performance and content, technology application, schedule milestones, and budget. It includes the work breakdown structure (WBS), WBS dictionary, integrated master schedule, preliminary life-cycle cost estimate, and workforce estimate.

[Provide descriptions of the following (or reference specific section(s) in a Directorate document(s):

1. *How the Directorate interacts with program offices and projects to meet its oversight responsibilities.*
2. *How the Directorate assesses project-derived integrated baselines established at the Preliminary Design Review (PDR).*
3. *How the Directorate tracks progress of projects against their established integrated baselines through the rest of the project life cycle.]*

[Text.]

4.1.3 Earned Value Management

Earned value management (EVM) is a management tool for measuring and assessing project performance through the integration of technical scope with schedule and cost objectives during the Phase C/D development period. EVM provides quantification of technical progress, enabling management to gain insight into project status and project completion costs and schedules.

NPR 7120.5D places specific requirements on single-project programs, projects, and supporting contracts. It leaves the option open for Mission Directorates to apply EVM to specific programs other than single-project programs.

[Provide descriptions of the following (or reference specific section(s) in a Directorate document(s):

1. *Directorate criteria for determining which programs will utilize EVM.*
2. *How the Directorate levies EVM requirements on the program in the Program Plan.*
3. *How the Directorate reviews and analyzes program (including single-project program) EVM reports.]*

[Text.]

4.1.4 Management Reporting

4.1.4.1 Mission Directorate Collection of Status Reports from Programs/Projects

[Describe (or reference specific section[s] in a Directorate document[s] that describes) how the Directorate collects technical, cost, schedule, and risk status information from its programs and projects. Include descriptions of types of information collected and frequency of collection.]

[Text.]

4.1.4.2 Mission Directorate Analysis of Program/Project Reports and Upward Reporting to Agency

[Provide descriptions of the following (or reference specific section(s) in a Directorate document(s):

1. *How the Directorate determines when programs or projects are at risk of not meeting programmatic commitments.*
2. *How the Directorate generates summary program/project reports for Agency management and the frequency of such upward reporting.*
3. *How the Directorate reports project/program issues to Agency management. Include, in particular, how the Directorate reports project issues that could result in either (1) Phase C through D estimate at completion (EAC) of the project to exceed by 15% or more the KDP-C–approved Integrated Baseline cost for Phases C through D, or (2) a milestone listed for Phase C/D on the project life-cycle chart (Figure 2-4) being delayed in excess of six months from the date scheduled in the KDP-C–approved Integrated Baseline.]*

[Text.]

4.1.5 Dissenting Opinions Process

[Describe how the NASA process for handling dissenting opinions during program and project development, which is described in NPR 7120.5D, Section 3.3, will be implemented within the Directorate. Include a description of how the Directorate assures an environment that encourages the voicing of dissenting opinions and appropriate resolution of issues raised on its space flight programs and projects.]

[Text.]

4.1.6 Reviews and Key Decision Points

Reviews occur throughout the program and project life cycles at key milestones to assess the quality of the design, uncover design deficiencies, identify risks to achieving performance on schedule and within budget, evaluate the status of and progress toward accomplishing the planned activities, and to establish readiness for follow-on events.

Program and project reviews will be scheduled as required by NPR 7120.5D and NPR 7123.1. They include independent life-cycle reviews, internal technical reviews, and peer reviews. The proper execution of the review process is a program or project responsibility and is regarded as an in-house activity, even if the reviews are conducted at a system contractor facility. Life-cycle reviews are followed by the required governing Program Management Council (PMC) review.

KDPs serve as gates for programs and projects to obtain approval to enter the next phase of the program or project life cycle. If and when the Decision Authority considers that the termination of a program or a project may be appropriate, a special termination KDP may be initiated (7120.5D, Paragraph 2.5.5).

[Provide descriptions of the following:

1. *Directorate role in convening and supporting life-cycle reviews, selecting Standing Review Boards, and in negotiating the Terms of Reference (ToR) document in compliance with NPR 7120.5D and NASA Guidance for Standing Review Board Implementation.*
2. *How support will be obtained from other NASA Directorates when needed.*
3. *Roles of pertinent Mission Directorate and Directorate division personnel, Program Manager, and Project Manager in the review, PMC, and KDP processes.*
4. *How the Directorate will identify that a termination KDP may be appropriate for one of its programs or projects and how it will call for and conduct a review to resolve the matter.*
5. *How the Directorate convenes special reviews for its programs and projects, including the criteria by which it does so.]*

[Text.]

4.1.7 Technical Authority

Section 3.4 of NPR 7120.5D provides the Agency's implementation of technical authority. Technical authority is implemented throughout the program/project life cycle and includes establishment, modification, and waiver of requirements and participation in program/project board activities.

[Provide description of the Directorate's participation in the technical authority process for space flight programs and projects. Include roles, responsibilities, interfaces, procedures, and practices of Directorate positions/personnel as these relate to technical authority.]

[Text.]

4.1.8 Acquisition

Acquisition strategy activities begin at the very start of the program/project life cycle, even before a program/project office is established. Acquisition strategy involves the senior leadership of the Agency, including the Directorate.

An Acquisition Strategy Planning (ASP) meeting is conducted with the coordination of the Office of Program and Institutional Integration (OPII) as the earliest planning and strategy vehicle. An Acquisition Strategy Meeting (ASM) is conducted with the coordination of OPII during Phase A.

[Provide descriptions of the following (or reference specific section(s) in a Directorate document(s):

1. *How the directorate supports the Agency ASP.*
2. *How the Directorate supports the program/project ASM, including identification of specific points of emphasis for the specific activity and criteria for evaluating program/project acquisition strategies.*
3. *How the Directorate reviews and approves long-lead procurements by programs (including single-project programs).]*

[Text.]

4.1.9 Information Management/Configuration Management

[Describe internal Directorate practices and support for program and project information management. Identify categories of program and project information that will be managed (e.g., budgetary, technical, and programmatic plans, requirements, direction, trades, project success criteria, etc.), the system used to manage them, and how it interfaces with other program and project information management systems.]

[Text.]

4.1.10 Export Control

All programs and projects, even those without international partners, implement export controls as required by law and regulation. At a minimum, Directorates generate and receive export-controlled information. Additionally, Directorates may employ foreign nationals, participate in international agreements, or otherwise have some involvement with exports of hardware and/or software.

[Provide descriptions of the following (or reference specific section(s) in a Directorate document(s):

1. *How the Directorate identifies, and obtains approval of, foreign nationals as Directorate employees, support contractors, or consultants.*
2. *How the Directorate obtains any required license(s) or technical assistance agreement(s).*
3. *How the Directorate maintains secure access to internally-generated, export-controlled information, in electronic library or otherwise.*
4. *How the Directorate reviews internally generated technical papers and presentations to prevent dissemination of export-controlled information.]*

[Text.]

4.1.11 Security

All programs and projects, even unclassified, implement precautions to ensure security and technology protection. These precautions occur throughout the life cycle and include precautions for physical security, IT security, and emergency response.

[Provide descriptions of the following:

1. *How the Directorate reviews and concurs with Crisis Response Plans and Continuity of Operations Plans for programs and projects.*
2. *How the Directorate implements IT security within the Directorate.]*

[Text.]

4.1.12 Environmental Planning

All programs and projects perform environmental planning to identify potential environmental impacts and associated mitigation actions and to identify necessary permits and other environmental protection requirements. These activities occur throughout the life cycle.

[Provide descriptions of the following, including interfaces with programs and projects at the Centers:

1. *How the Directorate complies with the National Environmental Policy Act (NEPA).*
2. *How the Directorate specifies requirements and reviews and approves program and project plans related to planetary protection and orbital debris.*
3. *How the Directorate approves project launch readiness.*
4. *What changes occur to the above Directorate roles and activities for a project that utilizes nuclear material.]*

[Text.]

4.1.13 Science Data Archiving

[Describe the Directorate's policies regarding science data archiving and release requirements on projects.]

[Text.]

4.2 Engineering Practices

4.2.1 General

[Describe the Directorate's engineering practices to ensure that applicable NASA requirements are properly implemented within its programs and projects. Add additional subsections as appropriate.]

4.2.2 Risk Management

NPR 7120.5D and NPR 8000.4, Risk Management Procedural Requirements, provide the Agency's policies and requirements for risk management (RM). RM is implemented

throughout the program/project life cycle and involves the entire program/project management team. RM utilizes a continuous RM process, including risk identification, risk analysis, risk planning, risk tracking, risk control, and documenting and communicating risk.

Mission Directorates provide oversight of the programs' (including single-project programs) RM activities and verify that programs are performing oversight of the projects' RM activities. Mission Directorates also assess risks through the Directorate PMC process, ensure that risk information is provided at KDPs, and have the Decision Authority accept (or not accept) primary risks prior to launch or delivery.

[Provide descriptions of the following (or reference specific section(s) in a Directorate document(s):

1. *How the Directorate verifies that programs are performing RM activities and that they are performing oversight of projects' RM activities.*
2. *Risk reporting process, from programs/projects to the directorate (e.g., required monthly, quarterly, at Directorate Program Management Council [DPMC] reviews, etc.).*
3. *How the Directorate assesses risk at DPMCs.*
4. *How the Directorate provides risk information at KDPs and how the Decision Authority accepts (or does not accept) primary risks.*
5. *How the Directorate utilizes risk management to assess risks to its overall programmatic portfolio.]*

[Text.]

5.0 TRACE AND COMPLIANCE

5.1 Traceability of NPR 7120.5D and Other Requirements

[Describe the process for tracing NPR 7120.5D requirements and other key Agency standards and requirements documents to Directorate practices. Identify any Directorate documentation that captures the trace.]

[Text.]

5.2 Process for Ensuring Compliance with NPR 7120.5D

[Describe the process for ensuring that the Directorate and the space flight programs and projects within the Directorate are compliant with NPR 7120.5D].

[Text.]

APPENDIX A: ACRONYMS AND ABBREVIATIONS

AA	Associate Administrator
AoA	Analysis of Alternatives
ASM	Acquisition Strategy Meeting
ASP	Acquisition Strategy Planning
CM	configuration management
DA	Decision Authority
DPMC	Directorate Program Management Council
EAC	estimate at completion
EVM	earned value management
FAD	Formulation Authorization Document
GPMC	Governing Program Management Council
IM	information management
IT	information technology
KDP	Key Decision Point
MD	Mission Directorate
MDAA	Mission Directorate Associate Administrator
MDIP	Mission Directorate Implementation Plan
MDPMC	Mission Directorate Program Management Council
MOU	memorandum of understanding
NASA`	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NPD	NASA Policy Directive
NPR	NASA Procedural Requirement
OPII	Office of Program and Institutional Integration
PCA	Program Commitment Agreement
PDR	Preliminary Design Review
PMC	Program Management Council
RM	risk management
SI	International System of Units
SMA	Safety and Mission Assurance
SOMD	Space Operations Mission Directorate
TA	Technical Authority
ToR	Terms of Reference
WBS	work breakdown structure

APPENDIX B: WAIVERS TO NPR 7120.5D

[Text.]

15 August 2007

NPR 7120.5D Implementation Planning Template Background & Overview

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The production of a compliance matrix may be the most straightforward approach to demonstrating Center compliance with NPR 7120.5D. Such a matrix would tie NPR 7120.5D requirements (i.e., "shall statements" from Chapter 4) to documented Center policies, practices, or procedures applicable to its space flight programs and projects. The NASA POLARIS web site (https://polaris.nasa.gov/index.cfm) contains a compliance matrix which may be used for this purpose if the Center elects the use of such as part of its overall approach to implementing NPR 7120.5D. [Under Management Support, click on Space Flight, then Requirements, then Compliance Matrix (optional).]

For requirements in NPR 7120.5D for which Center policies, practices and/or procedures need to be developed or modified in order to achieve NPR compliance, the Center Implementation Planning Template can assist the Center in identifying what work needs to be done. These work plans can then be referenced from the compliance matrix, with appropriate descriptive detail provided in support materials.

Where Centers will seek waivers to NPR 7120.5D requirements, such waivers should be prepared as soon as possible so that appropriate discussions can be held in a timely manner.

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1.0 INTRODUCTION

This Center Implementation Plan (CIP) constitutes the [Name of Center] Center's NASA Procedural Requirements (NPR) 7120.5D Implementation Plan. It is approved by the Center Director, NASA Chief Engineer, and NASA Chief Safety and Mission Assurance (SMA) Officer, with concurrence by Center cognizant authorities.

Chapters 2 and 3 of NPR 7120.5D describe the processes and practices NASA uses to carry out space flight program and project work. Chapter 4 of NPR 7120.5D is written using verifiable "shall" statements that define the requirements that spaceflight programs/projects must meet. Centers are expected to implement the Agency-prescribed processes and practices identified in NPR 7120.5D, Chapters 2 and 3, and the requirements identified in Chapter 4.

1.1 Purpose

The purpose of this plan is to describe the Center's approach for implementing space flight programs, projects, and supporting ground systems according to the requirements contained in NPR 7120.5D and consistent with the NASA strategic management and governance model.

The following paragraphs summarize the program and project management, technical authority, engineering, safety and mission assurance practices that apply to each requirements area within the NPR. Additional details needed to demonstrate compliance are also included or referenced if they are already documented in existing Center practices, processes, and procedures.

These practices are in effect unless formal waivers are approved per Section 3.6 of NPR 7120.5D.

1.2 Scope

This plan describes how the following will be applied to program and project management at the Center:

1. Applicable management, engineering, and Safety and Mission Assurance (SMA) requirements and standards.
2. Center program and project management practices.
3. Center engineering practices.
4. Center SMA practices.
5. Center Technical Authority (TA) practices.

It also describes the following:

1. Process for maintaining the Center's practices, ensuring traceability and conformance of these to Agency policies, standards and requirements (NASA Policy Directives [NPDs], NPRs, and other documents listed in Appendix H.1 of NPR 7120.5D).

2. Process for verifying that Center's programs and projects are compliant with Agency standards and Center practices.

This plan also recognizes that reimbursable work done for an agency other than NASA must use NPR 7120.5 as its basis for performing the work. An interagency agreement or a contract will explicitly identify requirements to be followed, along with any substitute requirements for equivalent processes.

1.3 Center Implementation Plan Owner and Change Control Process

This plan is maintained by [Name of Office].

The current version of this plan is located in *[provide location of document repository]*, the Center's official library for Center practices and processes. Plan revisions are prepared, reviewed, approved, and issued from time to time as necessary. Signatures are obtained for each revision as designated on the signature page. It is expected that any revisions to NPDs and NPRs are circulated to the Centers for impact analysis and assessment in order to keep the CIP current. Additionally, the Center performs a review at intervals of every *[specify interval]* to ensure that the Center's current best practices are incorporated. Refer to Section 3.3 for additional change control information.

2.0 CENTER ORGANIZATION AND INTERFACES

[Describe the organization, relationships, and interfaces among the various elements within the Center responsible for management and oversight of NASA and reimbursable (i.e., non-NASA) space flight program and project work performed at the Center. Clearly identify the chain of authority, accountability, and reporting for all aspects of programmatic and technical decision making.

Identify Center elements responsible for development and maintenance of Center practices and the program offices, engineering organization, Center Management Council (CMC), the Center Technical Authority, safety, health and mission assurance, and other independent oversight functions and support organizations that have a role in ensuring mission success.

Include one or more Center organization charts for clarification.]

[Text.]

3.0 CENTER PRACTICES

3.1 Description

Center practices are used to augment Agency NPRs and standards in the development and operations of space flight programs, projects, systems, instruments, and critical ground support facilities. The relevant institutional policies, requirements documents, procedures, templates, and guidelines are identified below:

[Note: If not obvious from the title, also provide a short description of the contents.]

1. Program and Project Management: *[List all applicable documents.]*
   [First document.]
   [Next document.]
2. Engineering: *[List all applicable documents.]*
   [First document.]
   [Next document.]
3. SMA: *[List all applicable documents.]*
   [First document.]
   [Next document.]
4. Technical Authority: *[List all applicable documents.]*
   [First document.]
   [Next document.]
5. Other Supporting Documents: *[List all applicable documents.]*
   [First document.]
   [Next document.]

3.2 Development

[Describe the process for developing the above documentation, in particular addressing how the Center assures that the scope and contents of the documentation enable the Center to meet the full complement of NPR 7120.5D requirements.]

[Text.]

3.3 Configuration Control Process

[The Center may issue new or revised practices and procedures at any time circumstances warrant. Revisions may be the result of evolving Agency directives, as discussed in Section 5.1. Describe the configuration control process that applies to the Center's practices and procedures, including how changes are initiated either by the Center or as a result of new or revised NPDs and NPRs from NASA Headquarters, and how changes are approved and incorporated into the CIP.]

[Text.]

3.4 Training Program

[Describe the Center's training program for personnel involved in program and project development. Provide a list of the classes used to train personnel in the Center's practices and procedures.]

[Text.]

3.5 Waivers and Changes to Requirements

Section 3.6 of NPR 7120.5D describes the waiver approval authority for space flight programs and projects. Different processes are applicable depending on whether the requirement for which a waiver or change is requested is an NPR 7120.5D requirement or a requirement from another source.

3.5.1 Waivers to NPR 7120.5D Requirements

Space flight Programs and Projects in formulation or implementation phases of the life-cycle at the Center that request waivers to requirements in NPR 7120.5D will follow the process described in Section 3.6.2 of NPR 7120.5D. If the Center believes that a Center-wide waiver to a particular 7120.5D requirement is appropriate for the Programs and Projects executed at the Center, such waivers may be prepared using the same form and process as specified in 7120.5D for individual Programs and Projects.

Center-wide waivers are contained in Appendix B of this document and are identified below *[list or confirm "None":*

1.

2.

etc.]

For non-NASA reimbursable space flight programs and projects, the Center will obtain formal waivers for any NPR 7120.5D requirements that are not to be followed.

3.5.2 Changes and Waivers to All Other Requirements

[Describe the Center's process for implementing the change request and waiver process for all other (i.e. non-NPR 7120.5D) requirements for its space flight programs and projects and how it assures that this process is consistent with the one described in Section 3.6.3 of NPR 7120.5D.]

[Text.]

4.0 IMPLEMENTATION RESPONSE TO NPR 7120.5D

4.1 Management Practices

4.1.1 Partnering

[Describe the Center's processes for partnering with other Centers, contractors, and other institutions or academia and how NASA standards and Center practices and procedures will be applied to program and project development.

Describe how Center Management Council operations and program/project decision and review processes are adapted for the case of programs and projects that are conducted in partnership across multiple Centers.

Identify any applicable MOUs or MOAs in place with other Centers.

Also describe the process for coordinating with the Space Operations Mission Directorate (SOMD) if a project requires space transportation, space telecommunications, or launch services.]

[Text.]

4.1.2 Planning, Costing, Scheduling, and Controlling Program and Project Baselines

4.1.2.1 Planning

Program Plans and their Control Plans, Program Commitment Agreements (PCAs), Formulation Authorization Documents (FADs) at both the program and project levels, and Project Plans and their Control Plans are prepared in response to programmatic direction provided by the Program Offices and Mission Directorates, Agency requirements in NPR 7120.5 D, and Center practices and procedures. Plans will be provided at the gates and maturity levels identified in 7120.5D and with the contents specified in the NASA templates.

[Provide descriptions of the following:

1. *Hierarchy of planning documents and approval authorities.*
2. *Approach to generating Control Plans (separate or part of Project Plans).*
3. *Approach for storing approved versions of Program Plans, Project Plans, and supporting Control Plans.]*

[Text.]

4.1.2.2 Work Breakdown Structure and Dictionary

There are no NASA requirements for a standard program-level WBS. A project WBS must be compliant with the NASA Standard WBS, which is defined down to the system level in NPR 7120.5D. A project's cost estimate, earned value methods, schedules, work agreements, deliverables, and plans must be consistent with its WBS.

[Provide descriptions of the following applicable to a project's WBS:

1. *Center Institutional WBS and Dictionary below the system level (if one exists).*
2. *Relationship of Center Institutional WBS to NASA Standard WBS (per Appendix G of NPR 7120.5D).*
3. *What WBS structure and reporting requirements are passed down to contractors and subcontractors.]*

4.1.2.3 Program Baseline

A program baseline is developed through the activities conducted during program formulation in response to the need for a program having been identified by NASA during program pre-formulation. Programs are recommended for assignment to Centers by the responsible NASA Mission Directorate, a Program Office is established, and appropriate formulation activities are conducted. Following program approval at Key Decision Point I (note that single-project programs which are approved at KDP II), a

program enters its implementation phase. Projects required to achieve the program's initial objectives are identified during the formulation and/or implementation phases of the program life-cycle. The program baseline, the key elements of which are captured in the Program Plan and supporting documents, is matured and maintained throughout the program life-cycle.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *The approach and/or mechanisms used at the Center to support the Agency's program planning.*
2. *The approach, documentation, and practices used at the Center to conduct the program formulation phase of assigned programs.*
3. *The approach, documentation and practices used at the Center to conduct the program implementation phase of assigned programs.*
4. *The approach and/or mechanism used by Center program management personnel in interacting with Center management, with management at NASA Headquarters, and with management at other Centers which are hosting a project away from a program office's "home" Center.]*

4.1.2.4 Integrated Project Baseline

Projects are established to help accomplish the objectives of the program of which they are a component. A project's integrated baseline consists of the project's technical performance and content, technology application, schedule milestones, and budget. It includes the WBS, WBS dictionary, integrated master schedule, preliminary life-cycle cost estimate, and workforce estimate.

The project's integrated baseline is matured and maintained throughout the project life cycle, with a draft due at Key Decision Point (KDP)-A, a preliminary at KDP-B, a baseline at KDP-C, and updates thereafter if the project scope changes.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for generating the integrated baseline.*
2. *Process for establishing work agreements with doing organizations.*
3. *Process for generating the life-cycle cost estimate consistent with the WBS and Cost Analysis Data Requirements (CADRe), including determination of reserves and application of risk analysis.*
4. *Process for Project Manager's review and verification of the adequacy of the integrated baseline.*
5. *Process negotiated with Mission Directorate/Agency for verification of integrated baselines (Integrated Baseline Review [IBR], etc.).*
6. *Process for conducting IBRs on major contracts.*
7. *Process for maintaining the integrated baseline.*

8. *Process for documenting integrated project baselines in Cost Analysis Data Requirements (CADRes).]*

[Text.]

4.1.3 Earned Value Management

Earned value management (EVM) is a management tool for measuring and assessing project performance through the integration of technical scope with schedule and cost objectives during the Phase C/D development period. EVM provides quantification of technical progress, enabling management to gain insight into project status and project completion costs and schedules.

NPR 7120.5D contains requirements for EVM applicable to projects and to contracts.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *The Center's validated Earned Value Management System (EVMS)* ***[or, if none]*** *the Center's plan for completing and validating an EVMS.*
2. *If the Center does not have a validated EVMS, the methods used to apply EVM principles to project management.*
3. *Process for applying EVM requirements to contractors in Request for Proposals (RFPs) and contracts.]*

[Text.]

4.1.4 Management Reporting

[Describe the process and frequency for reporting program and project technical, cost, schedule, and risk status to NASA and Center management. Describe how the Center Management Council (CMC) meets its 7120.5D-assigned oversight responsibilities for programs and projects executed at the Center.

Indicate that immediate written notice and a recovery plan will be sent to the Program Manager and Mission Directorate Associate Administrator (MDAA), if the latest Phase C through D estimate at completion (EAC) of the project exceeds agreed-to limits in the respective Project Plan.

Indicate that immediate written notice and a recovery plan will be sent to the Program Manager and MDAA, if a milestone listed for Phases C and D on the project life-cycle chart (NPR 7120.5D, Figure 2-4) is estimated to be delayed in excess of agreed-to limits in the respective Project Plan.

Describe the processes utilized at the Center for management reporting related to multi-Center projects and programs in which the Center has a role.]

[Text.]

4.1.5 Dissenting Opinions Process

[Describe how the NASA process for handling dissenting opinions during program and project development that is described in NPR 7120.5D, Section 3.3, will be implemented at the Center. Include a description of how the Center ensures an environment that

encourages the voicing of dissenting opinions on its space flight programs and projects; a description of the resolution path within its dissenting opinions process; and a description of the method by which its dissenting opinions process is communicated to its partners.]

[Text.]

4.1.6 Reviews and Key Decision Points

Reviews occur throughout the program and project life cycles at key milestones to assess the quality of the design, uncover design deficiencies, identify risks to achieving performance on schedule and within budget, evaluate the status of and progress toward accomplishing the planned activities, and to establish readiness for follow-on events.

Program and project reviews will be scheduled as required by NPR 7120.5D and NPR 7123.1. They include independent life-cycle reviews, internal technical reviews, and peer reviews. The proper execution of the review process is a program or project responsibility and regarded as an in-house activity, even if the reviews are conducted at a system contractor facility. Life-cycle reviews are followed by the required governing Program Management Council (PMC) review.

KDPs serve as gates for programs and projects to obtain approval to enter the next phase of the program or project life cycle.

[Provide descriptions of the following:

1. *How Standing Review Boards will be convened and how support will be obtained from other NASA Centers in compliance with NPR 7120.5D and NASA Standing Review Board (SRB) Handbook.*
2. *Process for negotiating the Terms of Reference (ToR) document and incorporating results into the review process.*
3. *Process for holding internal technical reviews and peer reviews in support of life-cycle reviews, as depicted in Figure 2.5 of NPR 7120.5D.*
4. *Request for Action (RFA) and/or Review Item Discrepancy (RID) initiation and processing.*
5. *Role of the Center Management Council, Center Technical Authority, Program Manager, and Project Manager in the review and KDP processes.*
6. *Process for interacting with other Centers for multi-Center programs and projects.]*

[Text.]

4.1.7 Technical Authority

Section 3.4 of NPR 7120.5D provides the Agency's implementation of the technical authority process. Technical authority is implemented throughout the program/project life cycle and includes approving changes to and waivers of all Technical Authority (TA)-owned requirements and participation in program/project board activities. The Center's practices and requirements and guidance for technical authority are identified in Section 3.1 of this document. For detailed information, refer to the Center Technical Authority Implementation Plan.

The Center has chartered the following individuals as Center TAs:

1. [Person and Title] is the Center Engineering TA.
2. [Person and Title] is the Center SMA TA.
3. [Person and Title] is the Center Health and Medical TA [or] There is no Center Health and Medical TA because the Center does not perform program/project work invoking this role (i.e., the Center does not launch human space flight missions).

[Text.]

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for approving changes to, and waivers of, TA-owned requirements.*
2. *Participation of Center technical authorities in program/project control boards, change boards, and internal review boards.*
3. *Roles and responsibilities of Center technical authority personnel, including Center Director, Center Engineering TA, Center SMA TA, Center Health and Medical TA (if identified above), Program/Project/System Level Chief Engineer (or equivalent), and Lead Discipline Engineer. Include appointment and funding information.]*

[Text.]

4.1.8 Acquisition

Acquisition strategy and execution activities occur throughout the program/project life cycle. Acquisitions may be from industry (including small, small disadvantaged, and others), from other NASA Centers, from domestic partners (e.g., Federal agencies), and from international contributors.

Acquisition activities are consistent with the top-level guidance provided by the Agency Acquisition Strategy Planning (ASP) meeting. Procurement actions comply with the Federal Acquisition Regulations (FAR) and the NASA FAR Supplement.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *The Center's approved purchasing system or equivalent, including scope, status of approval, and plan for revalidation.*
2. *Process for defining requirements on procurements let during Formulation and Implementation.*
3. *Process for make-or-buy decisions.*
4. *Process for identifying and obtaining required programmatic approval of long-lead procurements.*
5. *Process for working with NASA to obtain domestic and international agreements.*
6. *Process for implementing Risk-Based Acquisition Management and contractor incentives.]*

[Text.]

4.1.9 Technology Development

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that program and project technology development requirements are met.]

[Text.]

4.1.10 Information Management/Configuration Management

[Describe, or reference Center documents which describe, Center's institutional practices and support for project information management, configuration management, and engineering data archival. This includes configuration control of project plans, requirements, designs, trade studies, "as-built documentation", test procedures, test results, waivers, discrepancies, knowledge management, and lessons learned.]

[Text.]

4.1.11 Export Control

All programs and projects, even those without international partners, implement export controls as required by law and regulation. These controls occur throughout the life cycle, and include access to information by foreign nationals and the export of hardware, software, and design information.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for generating an Export Control Plan.*
2. *Process for identifying, and obtaining approval of, foreign nationals as participants on program/project teams.*
3. *Process for obtaining any required license or technical assistance agreement.*
4. *Process for maintaining secure access to export-controlled information in electronic libraries or otherwise.*
5. *Process for reviewing technical papers, presentations, and final reports to prevent dissemination of export-controlled information.*
6. *Process whereby the Center's projects interface with NASA HQ and the State Department as part of the Export Control Process.]*

[Text.]

4.1.12 Security

All programs and projects, even unclassified, implement precautions to ensure security and technology protection. These precautions occur throughout the life-cycle and include precautions for physical security, IT security, and emergency response.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for generating the Security Plan.*

2. *Process for planning and implementing physical, personnel, industrial, and counterintelligence/counterterrorism security, and conducting security awareness/education.*
3. *Process for identifying essential facilities, infrastructure, and critical information and potential threats and vulnerabilities.*
4. *Process for implementing IT security.*
5. *Process for identifying potential crises, emergencies, and response actions.]*

[Text.]

4.1.13 Environmental Planning

All programs and projects perform environmental planning to identify potential environmental impacts and associated mitigation actions and to identify necessary permits and other environmental protection requirements. These activities occur throughout the life cycle.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for generating the Environmental Management Plan.*
2. *Overview of the Center's Environmental Management System (EMS).*
3. *Role of the Center Environmental Management Office (EMO) and its interaction with NASA Headquarters.*
4. *Process for complying with the National Environmental Policy Act (NEPA).*
5. *Process for identifying required permits, waivers, documents, approvals, or concurrences required by law or regulation.]*

[Text.]

4.1.14 Program & Project Logistics

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that program and project logistics requirements are met.]

[Text.]

4.1.15 Mission Operations

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that space flight mission operations requirements are met.]

[Text.]

4.1.16 Science Data Archiving

[Describe the Center's infrastructure support to projects, if applicable, for archiving science data or data delivered to operational agencies (e.g., NOAA).]

[Text.]

4.2 Engineering Practices

[Describe, or point to documents which describe, the Center engineering practices put in place to ensure that applicable NASA requirements on space flight programs and projects are properly implemented at the Center. Note that the list of engineering areas identified below is not comprehensive; add additional subsections, as appropriate to the Center.]

4.2.1 Systems Engineering

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that systems engineering requirements are met.]

[Text.]

4.2.2 Design and "As-Built" Documentation

[Describe, or reference Center documents which describe, the approach for documenting design, "as-built", and "as deployed" configurations, including architectural drawings, design documents, Interface Control Drawings (ICDs), detailed drawings, Computer-Aided Design (CAD) files, CADRe, "as built" and "as deployed" hardware and software documentation, closeout photographs, etc.]

[Text.]

4.2.3 Risk Management

NPR 7120.5D and NPR 8000.4, Risk Management Procedural Requirements, provide the Agency's policies and requirements for risk management (RM). RM is implemented throughout the program/project life cycle and involves the entire program/project team. RM utilizes a continuous risk management (CRM) process, including risk identification, risk analysis, risk planning, risk tracking, risk control, and documenting and communicating risk.

The Center has assigned [Name and Title] as process owner for the Center CRM process.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for generating and approving the stand-alone program and project Risk Management Plans.*
2. *Process, including tool(s), for generating and maintaining the program/project risk list and associated risk mitigation plans.*
3. *Process for tracking and reporting risk status to program/project team members, MDAA/program office, and CMC, including use of Agency 5X5 risk matrix.*
4. *Process for presenting risks at program/project reviews, CMC reviews, and KDPs.*
5. *Process for approving primary risks prior to delivery to customer or launch.]*

4.2.4 Software Management

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that software management requirements are met.]

[Text.]

4.2.5 Orbital Debris

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that orbital debris requirements are met.]

[Text.]

4.2.6 Planetary Protection

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that planetary protection requirements are met on programs and projects executed at the Center for which these requirements are applicable.]

[Text.]

4.2.7 Nuclear Materials

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that requirements relating to the use of nuclear material are met on programs and projects executed at the Center for which these requirements are applicable.]

[Text.]

4.2.8 Human Factors, Health and Safety

[Summarize and point to Center practices for ensuring that human factors, health, and safety requirements are met.]

[Text.]

4.2.9 Human-Rating for Space Systems

[Summarize and point to Center practices, facilities, capabilities, and procedures for ensuring that human-rating requirements for space systems are met on programs and projects executed at the Center for which these requirements are applicable.]

[Text.]

4.3 Safety and Mission Assurance Practices

4.3.1 Safety and Mission Assurance

Safety and mission assurance planning and execution occur throughout the program/ project life cycle. Although SMA professionals lead the SMA implementation, all members of the program/project team contribute to mission success. The program/project employs an overall SMA process and organization, supported by specific SMA discipline activities, as applicable, to the undertaking.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Process for generating the SMA Plan.*
2. *SMA roles, responsibilities, and relationships, including interface with NASA Office of Safety and Mission Assurance (OSMA) and how Center institutional SMA personnel integrate with the program/project with the requisite independence.*
3. *Summary of how Center SMA practices comply with Agency SMA standards.*
4. *List of SMA disciplines utilized at the Center.]*

[Text.]

4.3.2 Safety

[Summarize and point to Center practices and procedures ensuring the safety of personnel, the public, and high-value hardware and software.]

[Text.]

4.3.3 Quality Assurance

[Identify Center practices and procedures relating to hardware and software quality assurance (QA).]

[Text.]

4.3.4 Reliability and Maintainability

[Identify Center practices and procedures relating to flight and ground equipment reliability and maintainability (R&M).]

[Text.]

4.3.5 Problem Reporting and Resolution System

Problems inevitably occur on a program or project. A disciplined methodology for identifying problems, identifying their root causes, and implementing effective problem solutions ensures that the problem is actually solved and, therefore, cannot jeopardize mission success.

[Provide descriptions of the following or reference specific section(s) in a Center document(s):

1. *Closed-loop problem reporting and resolution system, including roles, responsibilities, and relationships.*
2. *Data collection system and process for hardware and software problem and anomaly reports, problem analysis, and corrective action.*
3. *Vehicle(s) by which all personnel can alert management to potential problems/anomalies.*
4. *Flow-down of problem reporting and resolution requirements to contractors.]*

[Text.]

4.3.6 Mission Assurance Practices during Operations & Sustainment (Phase E)

[Identify Center practices and procedures relating to mission assurance during Phase E of the project life cycle.]

[Text.]

5.0 TRACE AND COMPLIANCE

5.1 Traceability of NPR 7120.5D and Other Requirements

[Name of Center] has a formal process for reviewing Agency requirements, including NPR 7120.5D and other directives (NPDs, NPRs, standards, etc.). When a new or revised directive relating to program/project work is issued, the Center's cognizant process owner and other affected entities review the document in detail, identify those requirements that are relevant to the Center's program and project work and not already covered in existing Center practices and procedures, and incorporate them into Center documentation, or, if warranted, request a waiver. (Normally the Center has participated in one or more reviews of a draft directive prior to its issuance, helping to ensure that the requirements can be reasonably implemented.)

A Center Directives Manager *[identify by individual name or role]* is the focal point for initiating this process. The Directives Manager notifies the cognizant process owner and coordinates with the process owner to notify managers of other affected organizations. For engineering and SMA Directives, this includes the Center Engineering and SMA Technical Authority, respectively. For detailed engineering directives (e.g., standards), this also includes the appropriate Lead Discipline Engineer.

The Center documents the traceability of new/revised directive requirements into the Center's practices and procedures. This is done by the following process: *[describe the process, use of traceability matrices, directive implementation memos, waivers, etc. The description should be compatible with and support the waiver process in Section 3.6 of NPR 7120.5D.]*

5.2 Process for Ensuring Center Compliance with NPR 7120.5D

[Describe the Center's process for ensuring program and project compliance with NPR 7120.5D].

[Text.]

APPENDIX A: ACRONYMS AND ABBREVIATIONS

ASM	Acquisition Strategy Meeting
ASP	Acquisition Strategy Planning
CAD	Computer-Aided Design
CADRe	Cost Analysis Data Requirements
CIP	Center Implementation Plan
CM	configuration management
CMC	Center Management Council
CRM	continuous risk management
EAC	estimate at completion
EMO	Environmental Management Office
EMS	Environmental Management System
EVM	earned value management
EVMS	Earned Value Management System
FAD	Formulation Authorization Document
FAR	Federal Acquisition Regulations
HQ	Headquarters
IBR	Integrated Baseline Review
ICD	Interface Control Document
IM	information management
IT	information technology
KDP	Key Decision Point
MDAA	Mission Directorate Associate Administrator
MOA	memorandum of agreement
MOU	memorandum of understanding
NASA`	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NPD	NASA Policy Directive
NPR	NASA Procedural Requirement
PCA	Program Commitment Agreement
PMC	Program Management Council
QA	quality assurance
R&M	reliability and maintainability
RFA	Request for Action
RID	Review Item Discrepancy
RM	risk management
SI	International System of Units
SMA	Safety and Mission Assurance

SOMD	Space Operations Mission Directorate
TA	Technical Authority
ToR	Terms of Reference
WA	work agreement
WBS	work breakdown structure

APPENDIX B: WAIVERS TO NPR 7120.5D

[Text.]

APPENDIX C: ADDITIONAL REFERENCES

Some paragraphs of NPR 7120.5D specify requirements via reference to additional NPRs, NPDs, and NASA Standards. Appendix H of NPR 7120.5D lists all the additional directives cited in that document. This appendix provides a mapping of 7120.5D directives references, tied to the paragraph numbers in this implementation plan template, to facilitate preparation of the Center's 7120.5D Implementation Plan. This appendix may be deleted upon completion of the Center Implementation Plan.

Para 4.1.9 Technology Development:

1. NPD 7500.2, NASA Technology Commercialization Policy and NPR 7500.1, NASA Technology Commercialization Process.

Para 4.1.10 Information Management/Configuration Management

1. NPR 7123.1, NASA Systems Engineering Processes and Requirements.
2. NPD 1440.6, NASA Records Management.
3. NPR 1441.1, NASA Records Retention Schedules.
4. NPD 2200.1, Management of NASA Scientific and Technical Information.
5. NPR 2200.2B, Requirements for Documentation, Approval and Dissemination of NASA Scientific and Technical Information.
6. NPR 7120.6, Lessons Learned Process.

Para 4.1.11 Export Control

1. NPR 2190.1, NASA Export Control Program.

Para 4.1.12 Security

1. NPR 1600.1, NASA Security Program Procedural Requirements.
2. NPD 1600.2, NASA Security Policy.
3. NPR 2810.1, Security of Information Technology.
4. NPR 1040.1, NASA Continuity of Operations (COOP) Planning Procedural Requirements.

Para 4.1.13 Environmental Planning

1. NPR 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114.

Para 4.1.14 Program and Project Logistics

1. NPD 7500.1B, Program & Project Logistics Policy.

Para 4.1.16 Science Data Archiving

1. NPR 1441.1, NASA Records Retention Schedules.
2. NPD 2200.1, Management of NASA Scientific and Technical Information.
3. NPR 2200.2B, Requirements for Documentation, Approval, and Dissemination of NASA Scientific and Technical Information.

Para 4.2.1 Systems Engineering

1. NPR 7123.1, NASA Systems Engineering Processes and Requirements.

Para 4.2.3 Risk Management

1. NPR 8000.4, Risk Management Procedural Requirements.

Para 4.2.4 Software Management

1. NPR 7150.2, NASA Software Engineering Requirements.
2. NASA-STD-8739.8, NASA Software Assurance Standard.

Para 4.2.5 Orbital Debris

1. NASA Safety Standard 1740.14, Guidelines and Assessment Procedures for Limiting Orbital Debris.

Para 4.2.6 Planetary Protection

1. NPD 8020.7, Biological Contamination Control for Outbound and Inbound Planetary Spacecraft.
2. NPR 8020.12, Planetary Protection Provisions for Robotic Extraterrestrial Missions.

Para 4.2.7 Nuclear Materials

1. NPR 8715.3, *NASA* General Safety Program Requirements.

Para 4.2.9 Human-rating for Space Systems

1. NPR 8705.2, NASA Human Rating Requirements for Spaceflight Systems.

Para 4.3.1 Safety and Mission Assurance

1. NPR 8715.3 NASA Safety Manual.
2. NPR 8705.2, NASA Human Rating Requirements for Spaceflight Systems.
3. NPD 8730.5, NASA Quality Assurance Program Policy.
4. NPR 8705.6, Safety and Mission Assurance Audits, Reviews and Assessments.
5. NPD 8720.1B, NASA Reliability and Maintainability (R&M) Program Policy.
6. NASA-STD-8719.13 NASA Software Safety Standard.
7. NASA-STD-8739.8, NASA Software Assurance Standard.
8. NPR 8735.2, Management of Government Quality Assurance Functions for NASA Contracts.